SPECIAL QUALITY V.H.F. DOUBLE TRIODE

M8081

Special quality double triode for use in equipment where mechanical vibration and shocks are unavoidable and where statistically controlled major electrical characteristics are required.

This data should be read in conjunction with GENERAL NOTES – SPECIAL QUALITY VALVES which precede this section of the handbook, and the index numbers are used to indicate where reference should be made to a specific note.

HEATER

V_h [1]	6.3	V
I_h	450	mA

CAPACITANCES[2] (measured without an external shield)

*c_{a-g}	1.6	pF
*c_{in}	2.1	pF
$c_{out'}$	450	mpF
$c_{out''}$	350	mpF
c_{h-k}	4.0	pF

*Each section

CHARACTERISTICS[3] (each section)

V_a	100	V
I_a	9.0	mA
*V_g	–0.9	V
g_m	5.6	mA/V
μ	38	
r_a	6.8	kΩ
R_k	0	Ω

* Fixed bias operation is not recommended

LIMITING VALUES[4] (absolute ratings)

f max.	250	Mc/s
$V_{a(b)}$ max.	550	V
V_a max.	330	V
p_a max.	2×1.6	W
I_k max.	25	mA
$-V_g$ max.	110	V
I_g max.	2×4.5	mA
V_{h-k} max.	100	V
R_{g-k} max. (cathode resistor bias)	500	kΩ
Maximum acceleration (continuous operation)	2.5	g
Maximum shock (short duration)	500	g
T_{bulb} max.	165	°C

TEST CONDITIONS (unless otherwise specified)

V_h (V)	V_{a-e} (V)	V_{g-e} (V)	R_k (Ω)	C_k (μF)
6.3	100	0	50	1000

Voltages are applied simultaneously to both sections. The measurements apply to each section, unless otherwise stated.

TESTS	*A.Q.L.*[5] (%)	*Individuals*[6] *Bogey*[9]	*Individuals*[6] *Min.*	*Individuals*[6] *Max.*	*Lot average*[7] *Min.*	*Lot average*[7] *Max.*	*Lot standard deviation*[8] *Max.*	
GROUP A								
Insulation								
a-rest, measured at –300V	0.25	—	100	—	—	—	—	MΩ
g-rest, measured at –100V	0.25	—	100	—	—	—	—	MΩ
Reverse grid current								
$R_g$max. = 1MΩ, V_{a-e} = 250V,								
R_k = 500Ω both sections strapped	0.25	—	—	0.5	—	—	—	μA
GROUP B								
Heater current	0.65	—	420	480	—	—	—	mA
Heater to cathode leakage current	0.65	—	—	—	—	—	—	
V_{h-k} = 100V cathode negative	—	—	—	10	—	—	—	μA
V_{h-k} = 100V cathode positive	—	—	—	10	—	—	—	μA
Anode current	0.65	—	6.5	11.5	—	—	—	mA
Mutual conductance	0.65	—	4.0	7.5	—	—	—	mA/V
Anode current V_{g-e} = –30V, V_{a-e} = 250V	0.65	—	—	75	—	—	—	μA
Group quality level[10]	1.0	—	—	—	—	—	—	

GROUP C								
Change in mutual conductance. $V_h = 5.7V$	2.5	—	—	15	—	—	—	%
Microphonic noise at the anode at 50c/s and 2.0g min. peak acceleration, both sections connected in parallel, $V_b = 250V$, $R_a = 2k\Omega$, $R_k = 1.5k\Omega$, $R_{g'} = R_{g''} = 0\Omega$.	2.5	—	—	15	—	—	—	mV (r.m.s.)
GROUP D								
Glass strain test[11A]. No applied voltages	6.5	—	—	—	—	—	—	
Base strain test[12]. No applied voltages	6.5	—	—	—	—	—	—	
Capacitances (unshielded). No applied voltages	6.5	—	—	—	—	—	—	
c_{in}	—	—	1.4	2.8	—	—	—	pF
$c_{out'}$	—	—	250	650	—	—	—	mpF
$c_{out''}$	—	—	250	550	—	—	—	mpF
c_{a-g}	—	—	1.2	1.8	—	—	—	pF
c_{h-k}	—	—	3.3	7.5	—	—	—	pF
Amplification factor	6.5	—	28	48	—	—	—	
Reverse grid current. $V_h = 7.0V$, $R_g = 1M\Omega$ both sections connected in parallel	6.5	—	—	1.0	—	—	—	μA

TESTS	A.Q.L.[5] (%)	Individuals[6] Bogey[9]	Individuals[6] Min.	Individuals[6] Max.	Lot average[7] Min.	Lot average[7] Max.	Lot standard deviation[8] Max.	
GROUP E								
Fatigue[14]								
V_h = 6.9V, 1 minute on 3 minutes off. No other voltages applied, 2g min. peak acceleration, f = 170c/s for 33 hours in each of 3 mutually perpendicular planes.								
Post fatigue tests								
Heater to cathode leakage current. $V_{h-k} = \pm 100V$	2.5	—	—	20	—	—	—	μA
Reverse grid current as in group A	2.5	—	—	1.0	—	—	—	μA
Mutual conductance	2.5	—	3.5	7.5	—	—	—	mA/V
Microphonic noise as in group C	2.5	—	—	35	—	—	—	mV (r.m.s.)
Sub-group quality level[10]	4.0	—	—	—	—	—	—	
Shock[15]								
No applied voltages, 500g								
Post shock tests								
Heater to cathode leakage current. $V_{h-k} = \pm 100V$	2.5	—	—	20	—	—	—	μA
Reverse grid current as in group A	2.5	—	—	1.0	—	—	—	μA
Mutual conductance	2.5	—	3.5	7.5	—	—	—	mA/V
Microphonic noise as in group C	2.5	—	—	35	—	—	—	mV (r.m.s.)
Sub-group quality level[10]	4.0	—	—	—	—	—	—	

GROUP F

Stability life test[14]

Running conditions: $V_{a-e} = 125V$, $R_k = 50\Omega$, $V_{h-k} = 180V$ (cathode negative)

Stability life test end points

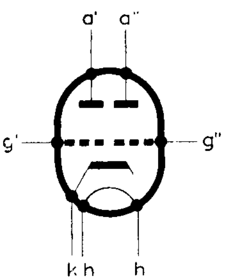
Change in mutual conductance after 1 hour	1.0	—	—	15	—	—	—	%

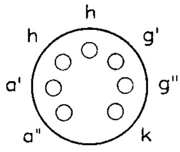
Intermittent life test

Running conditions: $V_{a-e} = 125V$, $R_k = 50\Omega$, $V_{h-k} = 180V$ (cathode negative)

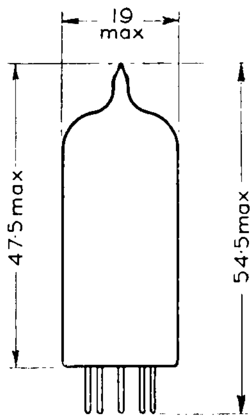
Intermittent life test end points		A.Q.L.[5] (%)	Min.	Max.	
Sub-group (a)					
Inoperatives[16]	500 hours	2.5	—	—	
	1000 hours	4.0	—	—	
Heater current	500 hours	2.5	420	480	mA
Heater to cathode leakage current. $V_{h-k} = \pm 100V$	500 hours	2.5	—	20	µA
	1000 hours	4.0	—	20	µA
Reverse grid current as in group A	500 hours	2.5	—	0.75	µA
	1000 hours	4.0	—	1.0	µA
Mutual conductance	500 hours	2.5	3.5	7.5	mA/V
	1000 hours	4.0	3.25	7.5	mA/V
Average change in mutual conductance	500 hours	—	—	15	%
Sub-group (b)					
Insulation as in group A	500 hours	4.0	50	—	MΩ
	1000 hours	6.5	30	—	MΩ
Group quality level[10]	500 hours	6.5	—	—	
	1000 hours	10	—	—	

	A.Q.L.[5] (%)	Min.	Max.	
GROUP G				
Valves are held for 28 days and retested for Inoperatives[16]	0.5	—	—	
Reverse grid current as in group A.	0.5	—	0.75	μA





B7G Base



4749

All dimensions in mm

The bulb and base dimensions of this valve are in accordance with BS448, Section B7G